Page 1

August-27-12 10:48:28 AM Item ID: D212-664-207 Accept \*N900040100\* Setup Start **Revision ID:** Item Name: Crosstube Low Standard Aft **Start Date:** 27/08/2012 Start Qty: 1.00 Cust Item ID: **Required Date:** 10/09/2012 Req'd Qty: 1.00 **Customer:** Reference: Run Process Plan: MLJ Date: 12/08/23 Tooling: Approvals: Date: QC: Date: \_\_\_\_\_ SPC (Y/N): Date: Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Reject Reject Accept Insp. Work Center ID Description **Run Hours** Code Qty Qty Number Stamp . **Draw Nbr** Revision Nbr 1 D212-664-247 Rev B (DEO) 100 0.00 DOCUMENT CONTROL DC 0.00 Memo Document Control Photocopy bluefile and create labels as per PPP D212-664-207 CHG002 110 Pick Kit 0.00 Packaging Mo \_\_ \*110\* 12/11/05 Packaging 0.00 Memo Packaging 120 0.00 BENDING MACHINE - CROSSTUBES \*120\* 12/11/05 CNC Bend 2 0.00 Memo CNC Alpha 160 Bender Bend tube as per Dwg D212-664-247 using CNC bender program and Folio

NCR: Y	es / No			3	WORK ORDER NON-G	O	NFORN	MANCE / UPE	DATE	٠	DQA: QA Closed:	Date Date	, ,
Work Orde	- 10 E				DISPOSITION				AGAIN		ARTMENT	····	
Part N	lo				Rework Scrap Use-as-is Work Order Update		N Therm	Skid-tube  Machining  oforming  Large Fab	Crosstu Small F Finishi Compos	ab ng		Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root					ption of work order update	1	nitial	Act			Sign &		
Cause	Date	Step	Qty		or Non-conformance	Ch	ief Eng	Descr	ription		Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved					, e		,						
					F	AUL	T CATE	GORY					
Landir	ng Gear			Г	General		Grain				Ovalized		Pressure/Forced
	Bending Centre I Cracks	Not Conce	ntric to	o/s	Bend BOM/Route Broken/Damaged		Hardwa	re on Incomplete	,		Over/Under Part Incorre	-	Temperature/Cure Weld
	Crushed Cuffs	/Crimped			Burrs Contamination		Instruct Mainte	ions Incomplete/Unance	Unclear		Part Lost/M Part Moved	- <u>.</u>	Wrong Stock Pulled
, Å*		eat on Strip ir in Bend	n Tube		Countersink Cut Too Short Drill Holes		Mislabe Misread				Positioned \ Power Loss/		Other

Out of Calibration

Out of Sequence

Outside Dimensions

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

	2012 661 2	_		8 4		7		**		- '5.27	
Item ID:	D212-664-20	07		Accept	*N0	2000	40100	)*	Setup Sta	rt *N	S1*
Item Name:	Crosstube Lov	v Standard Aft							Sto	p *N	S2*
Start Date:	27/08/2012	Start Qty: 1.00	*	1*	Cust	Item ID:					. 17
Required Date:	10/09/2012	Req'd Qty: 1.00	*	1*		omer:					
Reference:				•	**						
Approvals:	Process Pla	n:	Date:	Tooling:		Date:			Run Sta	1/1	R1*
	QC:		Date:	SPC (Y/N):	3-	Date:			Sto	*N	R2*
Sequence ID/ Work Center II	)	Operation Description		Set Up/ Run Ho		T GI lo	Tool # Plan _Code	Accep Qty	t Reject Qty	Reject Number	Insp. Stamp
130		QC15- Crosstube Dimens	sional Check	0.00	OAS	DART					Р
*130*					11	03	M		17.	-11-6	
.QC		Memo		0.00	9-89	~89	السا			1. T	<u></u>
Quality Control											
										.9	
140	•	Constal		0.00						Co.	*
*1/4 <b>0</b> *		Crosstubes									
Grosstubes Crosstubes		Memo	CNOUR P DD OD	0.00	`		_				
Crosstudes		*****	ENSURE PROP	ER JIG POSITIONING ***	*****					17	
		1-Drill Rivet	holes as per Dw	g D212-664-247 using DT8	972.***Use T-Pin***		KM		12-1	1-7	
		2-Drill pilot l	oles in tube as p	per Dwg D212-664-247 usin	ng DT8550 and DT855	51					
		3-Ream hole	to finish size in	tube as per Dwg D212-664-	247			•			
<b></b>		4-*** WEAR & Inspect for 664-247	LATEX GLOV surface damage.	ES WHEN HANDLING CF Repair damage within lim	ROSSTUBE*** Deburits as per Dwg D212-		Zn	12-	11-7		·
		5-Scribe part 247	# and batch # us	ing vibrating stylus as per [	Owg D212-664-	12	И	12	11-7 -11-7	•	

		DQA:	Daté:	·
NCR:	Yes / No	WORK ORDER NON-CONFORMANCE / UPDATE		• • •

											QA Closed:	Dat	te:
Work Orde	or:					DISPOSITION				AGAINST (	DEPARTMENT	/PROCESS	4
Part N	-					Rework Scrap Use-as-is			Skid-tube  Machining  noforming	Crosstube Small Fab Finishing		Water Jet d. Eng. Coor. re/Packaging	Engineering Quality Other
NCR N	۷o. ِ					Work Order Update			Large Fab	Composite		Supplier	
Root					Descri	ption of work order update	Ti	nitial	Ac	tion	Sign &		El .
Cause		Date	Step	Qty	(	or Non-conformance	Ch	ief Eng	Desc	cription	Date	Verification	n QC Inspector
Doc/Data Equip/Tooling Operator Material						- <del> </del>							
Setup Other Process Supplier													
Training Unapproved	H	· 											
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Landi	ing (	Gear				General							
		Bending Centre N	ot Conce	ntric to	o/s	Bend BOM/Route Broken/Damaged		Grain Hardwa	are ion Incomplete		Ovalized Over/Under Part Incorre		Pressure/Forced Temperature/Cure Weld
	_	Crushed/	Crimned		-	Burrs	$\vdash$	4 `	tions Incomplete,	/Unclear	Part Lost/M		Wrong Stock Pulled
	Crushed/Crimped Cuffs					Contamination		4	enance		Part Moved		
	Heat Treat					Countersink		Mislab	eled		Positioned	Wrong	
		Inspectio	n Strip in	Tube		Cut Too Short		Misrea	d	ĺ	Power Loss,	/Surge	Other
		Ripples ir	n Bend			Drill Holes		Offset					
		Torque V	Vaves in E	Extrusio	n [	Drawing .		Out of	Calibration				
	Turning Sequence Finish								Sequence				
		Wave/Tw	vist in Tul	be		Folio		Outside	e Dimensions				

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Outsource process - NDT

Page 3

August-27-12 10:48:28 AM Item ID: D212-664-207 Accept \*N900040100\* Setup Start **Revision ID: Item Name:** Crosstube Low Standard Aft **Start Date:** 27/08/2012 Start Qty: 1.00 **Cust Item ID: Required Date:** 10/09/2012 Req'd Qty: 1.00 **Customer:** Reference: Run Start Process Plan: \_\_\_\_\_ Date: \_\_\_\_ **Approvals: Tooling:** Date: Stop QC: \_\_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): Date: Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Accept Reject Reject Insp. Work Center ID Description Run Hours Qty Code Number Qty Stamp 150 QC5- Inspect part completeness to step on W/O 0.00 \*150\* QC 0.00 Memo Quality Control \*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\* 160 0.00 \*160\* \_\_\_\_\_Ø\_\_\_AI 12-11-8 HandFXtube 0.00 Memo Hand Finishing Crosstubes \*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\* 1- CLEAN CROSSTUBE WITH WASH'N WIPE 180 Outsource process - NDT per OSI038 4.1 0.00 \*120\* CX 12/11/09 (D) Outsource2 0.00 Memo

Liquid Penetrant Inspection as per QSI 038
Issue P/O: 18365 LPI as per ASTM 1417
Level 2 Attach copy of NDT results to work order

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

										DQA:	Date:	
NCR:	es /	No				WORK ORDER NON-C	ONFOR	MANCE / UPDATE		OA Charact	D.4	
				-		f	<del></del>			QA Closed:	Date:	
						DISPOSITION	2	AGAIN	IST DE	PARTMENT	PROCESS	
Work Orde	er:				<del> </del>	Rework		Skid-tube Crosstu	ho		Water Jet	Engineering
Part f	do.					Scrap		Machining Small F		Pro	d. Eng. Coor.	Quality
Paili	<b>v</b> O			<del></del>	·····	Use-as-is	The	moforming Finishi	<del></del>		e/Packaging	Other
NCR I	No.					Work Order Update		Large Fab Compos	- }		Supplier	
			<del></del>				<b>'</b>		<u> </u>			
Root					Descri	ption of work order update	Initial	Action		Sign &	¥	
Cause		Date	Step	Qty	(	or Non-conformance	Chief En	g Description		Date	Verification	QC Inspector
Doc/Data												
Equip/Tooling	Ш						ļ					
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Setup												
Other	*											
Process	Щ											
Supplier	$\square$							İ				
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Landi	ng Gea	 r				General	AOLI CAI	LOOKI				
		' nding				Bend	Grain		Г	Ovalized		Pressure/Forced
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	<del></del>	icks			"	Broken/Damaged	$\vdash$	tion Incomplete		Part Incorre	-	Weld
	Crushed/Crimped.					Burrs	<b>—</b>	ctions Incomplete/Unclear		Part Lost/M	<u> </u>	Wrong Stock Pulled
	Cu		,			Contamination	$\vdash$	tenance		Part Moved		
	$\vdash$	at Trea	t		<u> </u>	Countersink	Misla	peled		Positioned \	<b>V</b> rong	

Misread

Out of Calibration

Out of Sequence

Outside Dimensions

Offset

Power Loss/Surge

Other

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Inspection Strip in Tube

Torque Waves in Extrusion

Cut Too Short

Drill Holes

Drawing

Finish

August-27-12 10:48:28 AM Item ID: D212-664-207 Accept \*N900040100\* Setup Start **Revision ID:** Item Name: Crosstube Low Standard Aft **Start Date:** 27/08/2012 Start Qty: 1.00 **Cust Item ID: Required Date:** 10/09/2012 Req'd Qty: 1.00 **Customer:** Reference: Run Start Process Plan: \_\_\_\_\_ Date: **Approvals:** Tooling: Date: Stop Date: QC: SPC (Y/N): Date: Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Accept Reject Reject Insp. Work Center ID Description **Run Hours** Qty Code Qty Number Stamp 190 Receive & Inspect for Damage & Mat'l Certs 0.00 Packaging \*190\* Packaging 0.00 Memo Packaging \*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\* Ensure copy of NDT results attached to work order. 200 QC5- Inspect part completeness to step on W/O 0.00 \*200\* QC 0.00 Memo Quality Control \*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\* Inspect for damage & ensure results are as per Dwg D212-664-207 204 Crosstubes Chemical Conversion 0.00 HåndFXtube 0.00 Memo Hand Finishing Crosstubes \*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

I- PRESSURE WASH AND THEN USE WASH'N WIPE TO CLEAN CROSSTUBE AND CUFF BEFORE CHEMICAL CONVERSION

NCR: Y	NCR: Yes / No WORK ORDER NON-CONFORMANCE / UPDATE												
	,	•						•		QA Closed:	Date:	•	
Work Orde	er:		•		DISPOSITION				AGAINST DEF	PARTMENT	PROCESS		
Part N					Rework Scrap			Skid-tube Machining	Crosstube Small Fab		Water Jet d. Eng. Coor.	Engineering Quality	
NCR N	lo				Use-as-is Work Order Update	]	Thern	noforming Large Fab	Finishing Composite	Rec/Stor	e/Packaging Supplier	Other	
Root				Descri	ption of work order update	li	nitial	Act	ion	Sign &		·	
Cause	Date	Step	Qty	(	or Non-conformance	Chi	ief Eng	Desci	ription	Date	Verification	QC Inspector	
Doc/Data													
Equip/Tooling													
Operator													
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Setup				ļ									
Other					77								
Process								<u> </u>					
Supplier Training		1											
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onapproved .			1		F	AUL	T CATE	GORY		<u></u>	<u> </u>		
Landi	ng Gear				General								
	Bending				Bend		Grain			Ovalized		Pressure/Forced	
	Centre N	lot Conce	ntric to	o/s	BOM/Route		Hardwa	are		Over/Under	tolerance	Temperature/Cure	
	Cracks				Broken/Damaged	П	Inspect	ion Incomplete		Part Incorre	ct	Weld	
	Crushed	/Crimped			Burrs		Instruct	tions Incomplete/	Unclear	Part Lost/M	issing	Wrong Stock Pulled	
	Cuffs				Contamination		Mainte	enance		Part Moved			
Heat Treat					Countersink		Mislabe	eled		Positioned V	Vrong	7	
	Inspection	on Strip in	Tube		Cut Too Short		Misrea	d		Power Loss/	Surge	Other	
	Ripples i	n Bend			Drill Holes	$\vdash$	Offset						
	Torque \	Waves in I	Extrusio	n L	Drawing	$\vdash$	ł	Calibration					
	Turning	Sequence			Finish		Out of	Sequence					

Outside Dimensions

DQA:

Date:

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Wave/Twist in Tube

210

\*210\*

Crosstubes

Crosstubes

Crosstubes

Memo

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

1-Rivet and assemble Cuffs with T-Pin in the through bolt holes as per Dwg D212-664-247. with Sika flex in Between tube & Cuff

0.00

0.00

A/R SIKAFLEX -241/-291 BATCH: 23353

Page 5

Insp.

1 0 0

Stamp

									DQA:	Date:	
NCR: Ye	es / N	0			WORK ORDER NON-C	ONFOR	MANCE / UI		QA Closed:	Date:	•
Mark Order					DISPOSITION			AGAINST DE	PARTMENT	/PROCESS	
Work Order Part No					Rework Scrap Use-as-is	Ther	Skid-tube  Machining  moforming	Crosstube Small Fab Finishing		Water Jet d. Eng. Coor. re/Packaging	Engineering Quality Other
NCR No	o	<del>-</del>			Work Order Update		Large Fab	Composite	;	Supplier	
Root					Description of work order update	Initial	А	ction	Sign &		
Cause	Dat	e Ste	ер	Qty	or Non-conformance	Chief Eng	Des Des	cription	Date	Verification	QC Inspector
Doc/Data											
Equip/Tooling								•			
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Other 🧦 📘											
Process	_						1				
Supplier											
Training					(5)						
Unapproved						<u> </u>			<u> </u>		
					F	AULT CAT	EGORY				
Landin	g Gear				General						

Grain

Hardware

Maintenance

Out of Calibration

Out of Sequence

Outside Dimensions

Mislabeled

Misread

Offset

Inspection Incomplete

Instructions Incomplete/Unclear

Ovalized

Part Incorrect

Part Moved

Part Lost/Missing

Positioned Wrong

Power Loss/Surge

Over/Under tolerance

Pressure/Forced

Weld

Other

Temperature/Cure

Wrong Stock Pulled

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Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Bending

Cracks

Cuffs

Heat Treat

Crushed/Crimped.

Inspection Strip in Tube

Torque Waves in Extrusion

Centre Not Concentric to O/S

Bend

Burrs

BOM/Route

Broken/Damaged

Contamination

Countersink

Cut Too Short

Drill Holes

Drawing

Finish

**Run Hours** 

Code

Qty

Qty

215 \*915\*

OС Quality Control

Memo

0.00

0.00

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

\*\*\*Inspect cuff with T-Pin\*\*\*

QC5- Inspect part completeness to step on W/O

220

\*220\* SprayPaint

Spray Painting

Spray Painting per QSI005 4.2

0.00

SprayPaint

Memo

0.00

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME:

Start Time: 6:00

Fininsh Time: 7'-00

PAINT:

Start Time: 11.50 Finish Time: 12'.00 Page 6

Insp.

Stamp

Number

NCR: Y																
												С	QA Closed:	Da	ite:	
Work Orde	er.					DISPOSITION	i				AGAINST DI	EP/	ARTMENT/	PROCESS		
Part N						Rework Scrap		: A -: N	Skid-tube Machiñing		Crosstube Small Fab			Water Jet d. Eng. Coor.		Engineering Quality
NCR N	No					Use-as-is Work Order Update			oforming Large Fab		Finishing Composite	_	Rec/Stor	e/Packaging Supplie		Other
Root					Descri	ption of work order update	H	nitial	-	Actio	on	T	Sign &			
Cause	Da	te St	tep	Qty	(	or Non-conformance	Chi	ief Eng	13 D	escrip	ption	$\perp$	Date	Verification	on	QC Inspector
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Other														!		
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Unapproved			1													
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Landi	ng Gear					General					_	٦.				1
	Bend	•			_	Bend	_	Grain			-		Ovalized		$\vdash$	Pressure/Forced
	$\vdash$	re Not Co	oncen	tric to (	<sup>O/S</sup>  -	BOM/Route		Hardwa			<u> -</u> -	_	Over/Under		$\vdash$	Temperature/Cure
	Crac				<u> </u>	Broken/Damaged	$\overline{}$		on Incomplet		. <b>-</b>		Part Incorred		-	Weld
	<del></del>	ned/Crim	nped.		<u> </u>	Burrs			ions Incomple	ete/Ur	nclear	-	Part Lost/Mi	ssing	<u> </u>	Wrong Stock Pulled
	Cuffs				ļ	Contamination	-	Mainte					Part Moved			
	⊢⊣	Treat			_	Countersink	$\vdash$	Mislabe			-	—	Positioned V	_		104-
	— `	ection Str	-	Tube		Cut Too Short		Misread	İ		L		Power Loss/	Surge	<u> </u>	Other
	— ``	es in Ber				Drill Holes	-	Offset				_				
	<b>—</b> —	ue Wave			۱	Drawing		ł	Calibration			_				A-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1
	l lTurn	ing Seau	ence		1	Finish	1	IOut of 9	equence							

Outside Dimensions

Date:

DQA:

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Wave/Twist in Tube

0.00

0.00

240

\*240\* Crosstubes

Crosstubes

Crosstubes

Memo

1- Assemble as per Dwg D212-664-247

1-Abrade mating surfaces of support and crosstube with 400 grit sandpaper, clean the area with 4105S wash 'n' wipe

2-Install supports with Proseal 890 per DSI9563 and QSI 015 Proseal 890 Batch: 123103

3- Torque bolts as per dwg

Page 7

Insp.

Stamp

Z-11-11

NCR: Y													
										QA Closed:	Date:		
NA(nuli Oud a					DISPOSITION				AGAINST DE	PARTMENT	PROCESS		
Work Orde	··· ——			<del></del>	Rework	1		Skid-tube	Crosstube	1	Water Jet	Engineering	
Part N	lo.				Scrap	1 1		Machining	Small Fab	Pro	d. Eng. Coor.	Quality	
					Use-as-is	1	Thern	noforming	Finishing	Rec/Stor	e/Packaging	Other	
NCR N	lo			<u> </u>	Work Order Update	]		Large Fab	Composite	]	Supplier		
Root				Descri	ption of work order update		nitial	Ac	tion	Sign &			
Cause	Da	te Step	Qty		or Non-conformance	Ch	ief Eng	Desc	ription	Date	Verification	QC Inspector	
Doc/Data													
Equip/Tooling						ļ							
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				•		AUL	T CATE	GORY					
Landii	ng Gear			_	General		lc:.			Ovalized		Pressure/Forced	
	Bend	_		o/s	Bend BOM/Bowe		Grain		-	Over/Under	tolorance	Temperature/Cure	
		e Not Conce	entric to	<sup>0/5</sup>  -	BOM/Route	$\vdash$	Hardwa	ire ion Incomplete	-	Part Incorre	_	Weld	
	Crack			-	Broken/Damaged	$\vdash$	1 '	ion incomplete/ ions incomplete/	/Uncloar	Part Lost/M	<del>-</del>	Wrong Stock Pulled	
Crushed/Crimped.					Burrs Contamination	-	Mainte		Officiear	Part Moved		JWIOIIg Stock runed	
		Treat		-	Countersink	$\vdash$	Mislabe		<u> -</u>	Positioned \			
		rreat ection Strip i	n Tuha	-	Cut Too Short	-	Misrea		<u> </u>	Power Loss		Other	
		es in Bend	ii iube	-	Drill Holes		Offset	•	L	الـ الـ الـ الـ الـ الـ الـ الـ الـ الـ		1000	
		ue Waves in	Extrusio	n	Drawing	$\vdash$	4	Calibration					
	1,014	ac trates in	EVEL 0210	···	75.24.10		1 2 2 5 1 .						

Out of Sequence

Outside Dimensions

DQA:

Date:

Turning Sequence

Wave/Twist in Tube

Finish

0.00

0.00

260

\*2**ና**በ\*

Quality Control

QC4-100% Inspect kits for completeness

Memo

NCR: Y														
											QA Close	d: C	ate:	
Work Orde	·r·					DISPOSITION				AGAINST D	EPARTM <b>E</b> I	NT/PROCESS		
Work Orde	-		· · · · · · · · · · · · · · · · · · ·		<del></del>	Rework	7		Skid-tube	Crosstube		Water Je	∍t □	Engineering
Part N	10					Scrap	1		Machining	Small Fab	٦ ,	rod. Eng. Coo		Quality
raitiv	··· -		· · · · · · · · · · · · · · · · · · ·	-		Use-as-is	1		noforming	Finishing		tore/Packagin		Other
NCR N	l۵					Work Order Update	1		Large Fab	Composite		Supplie		
(VCIVI)	-						_				<b>.</b> 		L	
Root					Descri	ption of work order update	1	nitial	Act	tion	Sign &			
Cause		Date	Step	Qty		or Non-conformance	Ch	ief Eng	Desc	ription	Date	Verificat	ion	QC Inspector
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Material														
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Training						·								
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		···-					AUL	T CATE	GORY					
Landii					_	General		7		Г	_			1
	_	Bending				Bend	<u> </u>	Grain		-	Ovalized		-	Pressure/Forced
	$\overline{}$	Centre No	ot Conce	ntric to	o/s	BOM/Route	$\vdash$	Hardwa				der tolerance	-	Temperature/Cure
Cracks						Broken/Damaged	$\vdash$	4	ion Incomplete		Part Inco		-	Weld
Crushed/Crimped.						Burrs	$\vdash$	4	ions Incomplete/	Unclear	Part Lost	-		Wrong Stock Pulled
Cuffs						Contamination	$\vdash$	Mainte		<u> </u>	Part Mov			
Heat Treat					<u>_</u>	Countersink	$\perp$	Mislabe		1	Positione			1
	Inspection Strip in Tube					Cut Too Short	$\vdash$	Misread		Ĺ	Power Lo	ss/Surge	L	Other
	-	Ripples in			_	Drill Holes	_	Offset						
		Torque W	aves in l	Extrusio	n	Drawing	1	Out of	Calibration					

Out of Sequence

Outside Dimensions

DQA:

Date:

Turning Sequence
Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

280

QC21- Final Inspection - Work Order Release

0.00

\*280\*

QC

Quality Control

Memo

0.00

Insp.

Stamp

Page 9

									DQA:	Date:	
NCR: Y	es / N	o			WORK ORDER NON-C	ONFOR	MANCE / UPI		QA Closed:	Date:	•
Work Orde	or.				DISPOSITION		,	AGAINST DE	PARTMENT,	/PROCESS	
Part N	 No				Rework Scrap Use-as-is Work Order Update		Skid-tube  Machining  noforming  Large Fab	Crosstube Small Fab Finishing Composite	4	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root				Descri	ption of work order update	Initial	Act	tion	Sign &		
Cause	Da	e Step	Qty		or Non-conformance	Chief Eng	Desci	ription	Date	Verification	QC Inspector
Doc/Data						,					
Equip/Tooling											
Operator											
Material											
Setup											
Other											
Process	Ц						Į				
Supplier	Ш	- 1									
Training											
Unapproved			<u> </u>	<u> </u>							<u> </u>
						AULT CATE	GORY	* **			
Landi	ng Gear			_	General			<del></del>	٦	f	<b></b>
	Bend	-		_	Bend	Grain		<u> </u>	Ovalized	<u> </u>	Pressure/Forced
	${f oxdot}$	e Not Conce	entric to	O/S	BOM/Route	Hardwa			Over/Under	<del></del>	Temperature/Cure
	Crack				Broken/Damaged	<del></del>	ion Incomplete	<u></u>	Part Incorre	<b> </b>	Weld
	<del></del>	ed/Crimped	l.		Burrs .	<b>—</b>	tions incomplete/	Unclear	Part Lost/M		Wrong Stock Pulled
	Cuffs			<u> </u>	Contamination	<del></del>	enance		Part Moved		
	Heat			_	Countersink	Mislabe			Positioned \	_	7
	Inspe	ction Strip i	n Tube		Cut Too Short	Misrea	d	L	Power Loss,	/Surge	Other
	Rippl	s in Bend			Drill Holes	Offset					

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing .

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

### **Picklist Print**

August-27-12 10:48:32 AM

Work Order ID: 77283

D212-664-207

Parent Item Name:

Parent Item:

Crosstube Low Standard Aft

\*77283\*

\*D212-664-207\*

**Start Date: 27/08/2012** 

**Required Date:** 10/09/2012

Start Qty: 1.00

Required Qty: 1.00

**Comments:** 

IPP Rev:A New Issue 07.09.12 EC verified by: JLM

IPP Rev:B ECN 1100p 08-01-11 DD verified by: EC IPP Rev:C ECN 1121 08-02-25 DD verified by:eC

IPP Rev: D QC5 replaced by QC15 at step 5 KJ Verified by: ec

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D212-664- 207TRNRevA		Manufactured	No			110	Each	0.0000	<sub>1</sub>	$\overline{1}$		Λo	17/11/2
*D212-664  Crosstube Turning Detail	4-207TF	RNRevA	*		B 898	353			**	<u> </u>	· ·		1911/05
D3660-1		Manufactured	No			140	Each	20.0000	2	2			
*D3660-1*	•								**				=

CUFF

Location	Loc Qty	Loc Code	
LG	2		
80359	2		
ST477	10		
87445	10		
ST482	8		
53501	1		
76983	1		_
88394	6		_

mo 12/11/06

NCR: Y	NCR: Yes / No WORK ORDER NON-CONFORMANCE / UPDATE .												
										QA Closed:	Date	:	
Work Orde	ar.				DISPOSITION		AGAINST DEPARTMENT/PROCESS						
WOIK OIGE					Rework	7 <b> </b>	Skid-tube Crosstube				Water Jet	Engineering	
Part N	10.				Scrap			Machining	Small Fab	Pro	d. Eng. Coor.	Quality	
					Use-as-is	1	Therm	noforming	Finishing	Rec/Stor	e/Packaging	Other	
NCR N	No			<del></del>	Work Order Update	]	Large Fab Composit				Supplier		
Root				Descri	ption of work order update	11	nitial	Ac	tion	Sign &			
Cause	Date	Step	Qty	•	or Non-conformance	Ch	ief Eng	Desc	cription	Date	Verification	QC Inspector	
Doc/Data							_						
Equip/Tooling													
Operator													
Material													
Setup													
Other									ļ				
Process													
Supplier													
Training													
Unapproved		1					_			<u> </u>			
						AUL	T CATE	GORY					
Landi	ng Gear			_	General		ı			1	_	$\neg$	
	Bending				Bend	$\vdash$	Grain			Ovalized	_	Pressure/Forced	
	Centre N	ot Conce	ntric to C	D/S	BOM/Route	$\vdash$	Hardwa			Over/Under	<u> </u>	Temperature/Cure	
	Cracks				Broken/Damaged	_		ion Incomplete		Part Incorre	F	Weld	
	Crushed/	'Crimped			Burrs	-		ions Incomplete	/Unclear	Part Lost/M	issing	Wrong Stock Pulled	
	Cuffs				Contamination	$\vdash$	Mainte			Part Moved			
	Heat Trea	at			Countersink		Mislabe	eled		Positioned V	_	_	
	Inspectio	n Strip in	Tube	L	Cut Too Short		Misread	t		Power Loss/	'Surge	Other	
	Ripples in	n Bend			Drill Holes		Offset						
	Torque V	Vaves in E	Extrusion	·	Drawing		Out of (	Calibration					
	Turning S	Sequence	!		Finish		Out of S	Sequence			***************************************		
	Wave/Tw	vist in Tul	be		Folio		Outside Dimensions						

DQA:

Date:

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

### **Picklist Print**

August-27-12 10:48:32 AM

Work Order ID: 77283

Parent Item:

CR3212-4-06

D212-664-207

Parent Item Name: Crosstube Low Standard Aft

\*77283\*

\*D212-664-207\*

**Start Date: 27/08/2012** 

**Required Date:** 10/09/2012

Start Qty: 1.00

Required Qty: 1.00

Each

Purchased 220 \*CR3212-4-06\*

796.0000

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44

Al 12-11-9

123301 Location	<u>Lo</u>	c Qty	Loc Code	
ST329		503		
122378		503		
ST330		240		
120521		40		
122141		200		
ST331		53		
112492		18		
112794		8		
119717		27		
	240	Each	162,0000	4

D3595-063-530 \*D3595-063-530\*

RUBBER CUSHION

Manufactured

No

No

\*\*

Al 12-11-13

Location Loc Qty Loc Code LG 50 79932 13 82656 37 LG051 73 <u>8783</u>3 73 MAT052 39 63407 67185 70067 18 72745 75783

											DQA:	Dat	e:	
NCR:	Yes	/ No				WORK ORDER NON-	100	NFORM	ANCE / UPDATE			_	_	•
					·	Y					QA Closed:	Dat	e:	
Work Ord	or.					DISPOSITION			AGAIN	ST DE	PARTMENT	/PROCESS		
Part I	-					Rework Scrap		Skid-tube Crosstube Machining Small Fab			Water Jet d. Eng. Coor.		Engineering Quality	
NCR I	No.					Use-as-is Thermoforming Finishing Work Order Update Large Fab Composite			~	Rec/Sto	Other			
Root		· · ·			Descri	ption of work order update	Π	Initial	Action		Sign &		T	
Cause		Date	Step	Qty	(	or Non-conformance	Ch	ief Eng	Description		Date	Verification		QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved														
						F	AUI	T CATE	GORY					
Landi				,		General		<u> </u>			<b>7</b>			
		Bending Centre Not Concentric to O/S			o/s	Bend BOM/Route		Grain Hardwa	re		Ovalized Over/Under	tolerance		Pressure/Forced Temperature/Cure
		Cracks				Broken/Damaged		Inspecti	on Incomplete	L	Part Incorre	ct	_	Weld
	-	Crushed/	Crimped			Burrs	$\perp$	-{	ions Incomplete/Unclear	_	Part Lost/M	-		Wrong Stock Pulled
		Cuffs				Contamination		Mainte			Part Moved			
		Heat Trea	it			Countersink		Mislabe	led	<u> </u>	Positioned Wrong			1
		Inspectio	n Strip in	Tube		Cut Too Short		Misread	d		Power Loss/Surge			Other
	]	Ripples in	Bend		-	Drill Holes		Offset						

Out of Calibration
Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

August-27-12 10:48:33 AM

Work Order ID: 77283

Parent Item:

D212-664-207

Parent Item Name: Crosstube Low Standard Aft

\*77283\*

\*D212-664-207\*

Start Date: 27/08/2012

**Required Date:** 10/09/2012

Start Qty: 1.00

Required Oty: 1.00

D2940-1 \*D2940-1\*

MS21920-28

Manufactured No

No

No

240

Each

Each

23 0000

Loc Code

2 \*\*

2

AB 12-11-13

12-11-13

90191 Location

Purchased

Manufactured

Loc Qty LG052 23 79118 2 82657 1 87921 20

78.0000

\*\*

(9)

Glamp(per MIL-DTL-8783C)

123243

Location Loc Qty Loc Code FG 5 105884 5 LG050 55 118713 3 120054 2 122518 50 LG051 18

240

121440 122204 10 255 Each

Loc Qty

13

12

13.0000

Placard

Location ST042

83582 85228

Loc Code

NCR: Yes / No WORK ORDER NON-CONFORMANCE / UPDATE .												
										QA Closed:	Date	e:
Work Orde	r:				DISPOSITION				AGAINST DE	PARTMENT	PROCESS	
Part N					Rework Scrap Use-as-is	Th	Skid-tube Crosstube  Machining Small Fab  Thermoforming Finishing				Water Jet d. Eng. Coor. re/Packaging	Engineering Quality Other
NCR N	lo				Work Order Update	<sup>]</sup>		Large Fab	Composite		Supplier	
Root				Descri	ption of work order update	Initia	al	Act	tion	Sign &		
Cause	Date	Step	Qty		or Non-conformance	Chief I	Eng	Desci	ription	Date	Verification	QC Inspector
Doc/Data						1	ŀ					
Equip/Tooling						1						
Operator							1					
Material												
Setup							İ					
Other												
Process								1				
Supplier		ł	1									
Training												
Unapproved		<u> </u>				<u> </u>	l			<u> </u>		
	<u>.</u>				<del></del>	AULT C	ATEC	3ORY				-
Landii	ng Gear			_	General				r <del></del>	1	Г	
	Bending				Bend	Gra			<u>                                     </u>	Ovalized		Pressure/Forced
	Centre No	ot Conce	ntric to C	<sup>D/S</sup>  -	BOM/Route		'dwa		-	Over/Under	<b>⊢</b>	Temperature/Cure
	Cracks			<u> </u>	Broken/Damaged	<b>—</b>		on Incomplete		Part Incorre	<b>+</b>	Weld
	Crushed/	Crimped		<u> </u>	Burrs	_		ions Incomplete/	Unclear	Part Lost/M	issing [	Wrong Stock Pulled
	Cuffs			-	Contamination	<b></b>		nance	-	Part Moved	46	
	Heat Trea		T. A.	-	Countersink		slabe		<u> </u>	Positioned V		Other
	Inspectio		Tube	<u> </u>	Cut Too Short	$\vdash$	read	l		Power Loss/	Surge [	Other
	Ripples in			<u> </u>	Drill Holes	$\vdash$	set	Salthanain -				<del></del>
	Torque W			\ 	Drawing			Calibration			<del>.</del>	
	Turning Sequence				Finish	$\square$ Ou	t of S	Sequence				

Outside Dimensions

Date: \_\_\_

DQA:

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Wave/Twist in Tube

August-27-12 10:48:33 AM

Work Order ID: 77283

D212-664-207

Parent Item:

Parent Item Name: Crosstube Low Standard Aft

NAS1149D0663J Purchased

Purchased

\*77283\* \*D212-664-207\*

Start Date: 27/08/2012

**Required Date:** 10/09/2012

Start Qty: 1.00

Required Qty: 190

5m3 27 AN6-40A

Purchased

No

No

No

255

Each

869.0000

\*\*

Location Loc Oty Loc Code 314 578 122441 578

ST300 291 117677 25 118384 3 118927 48

119075 15 120308 200 255 Each

Each

122.0000

0.0000

\*\*

122441

Location Loc Qty Loc Code ST340 50

255

122416 50 ST342 72 120187 66 120833 4 121827 2

											DQA:	Date:	
NCR:	⁄es	/ No	,			WORK ORDER NON-C	O	NFORM	/ANCE / UP	DATE	QA Closed:	Date:	•
				·	<u> </u>	DISPOSITION				AGAINST DE	****		
Work Ord	-					Rework			Skid-tube	Crosstube	Dro	Water Jet	Engineering Quality
Part I NCR I	•	-				Scrap Use-as-is Work Order Update				<del></del>	1	d. Eng. Coor. re/Packaging Supplier	Other
IVCIV	١٠٠.	<del></del>		<del></del>	·	work order opdate	۱		carge rab	composite	j	3455	ـــا ـــا
Root					Descri	ption of work order update		nitial	Ac	ction	Sign &		
Cause	Date Step Qty		(	or Non-conformance	Ch	ief Eng	Desc	cription	Date	Verification	QC Inspector		
Doc/Data													
Equip/Tooling	Щ												
Operator	Ш												
Material	Ш												
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Process	Ш												
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Landi	ng G	Sear				General General	AUL	T CATE	JUNT				
		Bending				Bend		Grain			Ovalized		Pressure/Forced
	Н	Centre No	ot Conce	ntric to		BOM/Route	$\vdash$	Hardwa	re	1	Over/Under	tolerance	Temperature/Cure
	Н	Cracks			· –	Broken/Damaged		1	on Incomplete		Part Incorre	<b>⊢</b>	Weld
	Н	Crushed/	Crimped		-	Burrs		1	ions Incomplete,	/Unclear	Part Lost/M		Wrong Stock Pulled
	-	Cuffs		-	<u> </u>	Contamination	$\vdash$	Mainte			Part Moved		
	-	Heat Trea	ıt			Countersink		Mislabe			Positioned \	Vrong	
	$\vdash$	Inspection		Tube		Cut Too Short		Misread		<del> </del>	Power Loss/Surge		Other
	-	Ripples in				Drill Holes		Offset		<u> </u>	_ · · · · · · · · · · · · · · · · · · ·	~ <u>_</u>	
, H., H.					n	Drawing		4	Calibration			· · · · · · · · · · · · · · · · · · ·	-

Out of Sequence

Outside Dimensions

Turning Sequence
Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

August-27-12 10:48:33 AM

Work Order ID: 77283

Parent Item:

D212-664-207

Parent Item Name: Crosstube Low Standard Aft

Purchased

No

\*77283\* \*D212-664-207\*

Start Date: 27/08/2012

Required Date: 10/09/2012

Required Qty: 1.00

Start Qty: 1.00

Loc Code

Location	Loc Qty
ST340	50
122407	50
ST342	39
120423	9
121825	30

255

Each



											DQA:	Date	e: _	
NCR: Y	es /	No			WORK ORDER NON-	COI	VFORN	MANCE / UP	DATE			_		•
						-					QA Closed:	Dat	e:	
Work Orde	ar:				DISPOSITION				AGAINST [	DEI	PARTMENT	/PROCESS		•
Work Orde		·			Rework	Rework Skid-tube Crosstube				Water Jet			Engineering	
Part N	No.				Scrap Machining Small Fab				Pro	d. Eng. Coor.		Quality		
					Use-as-is Thermoforming Finishing			Rec/Sto	re/Packaging		Other			
NCR N	No				Work Order Update Large Fab Composite			Composite			Supplier			
Root				Descri	ption of work order update		Initial	Act	tion		Sign &			
Cause	Da	te Step	Qty	(	or Non-conformance	Ch	nief Eng	Desc	ription		Date	Verification	1	QC Inspector
Doc/Data						1		•						
Equip/Tooling				•										
Operator														
Material														
Setup														
Other														
Process							•							
Supplier														
Training	Ш													
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					F	AUI	LT CATE	GORY						
Landi	ng Gear				General		-		-		•	r		1
	Bend	ling		L	Bend		Grain				Ovalized			Pressure/Forced
	Cent	re Not Conc	entric to	o/s	BOM/Route		Hardwa	re	1		Over/Under	tolerance		Temperature/Cure
	Crac	<b>&lt;</b> S			Broken/Damaged		Inspecti	on Incomplete	1		Part Incorre	ct		Weld
	Crushed/Crimped .				Burrs		Instruct	ions Incomplete/	Unclear		Part Lost/M	issing		Wrong Stock Pulled
	Cuff	;	-		Contamination		Mainte	nance			Part Moved			
	Heat	Treat			Countersink		Mislabe	led			Positioned Wrong			_
	Insp	ection Strip	in Tube		Cut Too Short		Misread	ı	:		Power Loss,	<sup>/</sup> Surge		Other
]	Ripp	les in Bend			Drill Holes		Offset				_			

Out of Calibration

Out of Sequence

Outside Dimensions

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

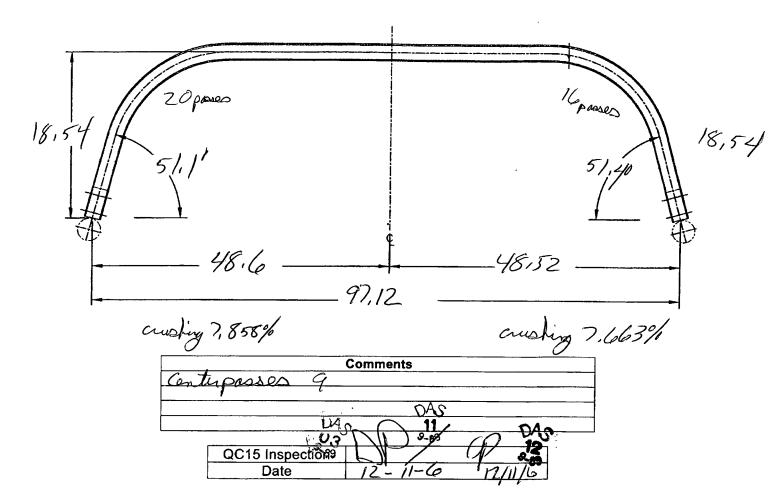
Torque Waves in Extrusion

Drawing

Finish

DART AEROSPACE LTD	Work Order:	77283
Description: Crosstube Low Aft (205/212)	Part Number:	D212-664-207
Inspection Dwg: D212-664-247 Rev: B		Page 1 of 1

Required Dimension	Min	Max
Height	18.16	18.42
1/2 Span	48.55	48.81
Angle	49	52
Total Span	97.1	97.62



Rev	Date	Change	Revise	d by	Approved
Α	08.02.29	New Issue	KJ/JM	. ^	
В	10.04.01	Dwg Rev updated	KJ	XX	12
				70	

# **Dart Aerospace Ltd**

W/O:			W	ORK ORDER CHANGI	ES	· · · · ·				
DATE	STEP	PRO	OCEDURE CH	ANGE		Зу	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
									r rod wgr	
Part No	:	PAR #:	Fault Cate	egory:	_ NCR:	Yes N	lo <b>DQA</b>	:	_ Date: _	
	R	esolution:	Disposition		Date:					
NCR:		\	WORK ORD	ER NON-CONFORMA	NCE (	NCR)				
DATE	OTED	Description of NC		Corrective Action Section			Verifica	ation	Approval	Approval
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng		Sign & Date	Sectio		Chief Eng	QC Inspector
					3,1	• • •				
						GE				
						Carrier.				
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	-									
									į	
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NOTE: Date & initial all entries

	-			
Item	Qty -247	Qty -247B	Part Number	Description
<u> </u>				
1	X		D212-664-247	CROSSTUBE ASSEMBLY (205/212 LOW AFT)
2		X	D212-664-247B	CROSSTUBE ASSEMBLY (214 LOW AFT)
3			D0000 400	
			D6008-132	CROSSTUBE
4	_ 2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	2	2	D3660-1	CUFF
7	4	4	MS21920-28	CLAMP (OR MS21920-30)
8	44	44	CR3212-4-06	RIVET (OR M7885/3-4-06)
9	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC 299-947-100, TYPE II, CLASS 2 ADHESIVE)
10	A/R	A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

#### **GENERAL NOTES:**

1) MATERIAL: MANUFACTURED FROM D6008-132

FINISHED LENGTH = 128.268±0.020 (BEFORE BENDING/TRIMMING)

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

PAINT OUTSIDE PER DART QSI 005 4.2 TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.

UNITS: INCHES UNLESS OTHERWISE NOTED.

BREAK SHARP EDGES 0.005 TO 0 010 MAX.
IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.

7) WEIGHT D212-664-247 = 36 6 lbs (PER IIN-D212-664)
D212-664-247B = 36.6 lbs (PER IIN-D212-664)
8) PART IS SYMMETRIC ABOUT CENTERLINE.

- WHEN MACHINING TAPER, RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON 0.D, EXCEPTUP TO 10% IS ALLOWED IN AREA NOTED.

  11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

  12) INSTALL D2940-1 SUPPORTUSING 0.03\* TO 0.05\* THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF

- D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015 LET CURE FOR 12 HOURS AFTER
- INSTALLATION AND PROR TO PACKAGING.

  13) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.

  14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SUPPORT. SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS
- NOT BOTTOMED-OUT AFTER TORQUING.

  16) INSTALL D3660-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 17) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT

SHOPCLEY RETURN OF

ENGLARISE G

UNCONTROLLED COPY

SUBJECT TO AMENDMENT

WITHOUT NOTICE

WORK GRDER NO. 77283 M.C.J

11/12/01

DEO ATTACHED

D

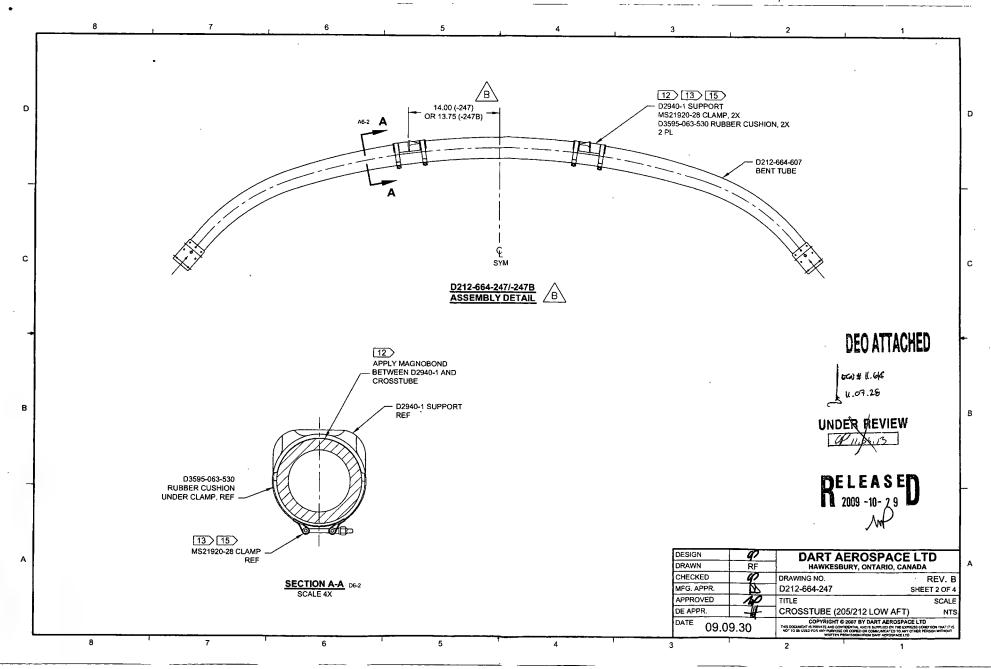
550# 11-614

В			OTES/PART LIST; UPDATE TO RDS; ADD -247B (ZN C4-2, D5-2)	RF	09.09.30		
Α	NEW IS	SSUE	CP	07.07.07			
REV.	DESCRIPTION				DATE		
DESIGN		P	DART AEROSPA	<b>ACF</b>	LTD		
DRAWN RF			HAWKESBURY, ONTARIO, CANADA				
CHECK	ED .	P	DRAWING NO.		REV. B		
MFG. APPR.		N	D212-664-247	SHEET 1 OF			
APPROV	/ED	NO	TITLE		SCALE		
DE APP	R.	4	CROSSTUBE (205/212 LOW	AFT)	NTS		
DATE 09.09.30			COPYRIGHT © 2007 BY DART AEROSPACE LTD  THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONCIDENT THAT IT IS  NOT TO BE USED FOR ANY PURPOSE OR CONED OR CONCUMENTATION TO ANY OTHER PERSON WITHOUT WHITTEN PERSONS WITHOUT DEPENDENT AND PROPORTION LTT				

# **Dart Aerospace Ltd**

W/O:			W	ORK ORDER CHANG	iES .			-	
DATE	STEP	PRO	OCEDURE CH	ANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
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								,	
Part No	;	PAR #:	Fault Cat	egory:	_ NCR: Yes	No <b>DQ</b>	A:	Date:	
	R	esolution:	Dispositi	on:	_ QA: N/C CI	osed:	-	Date: _	
NCR:			WORK ORE	DER NON-CONFORM	ANCE (NCR	()			
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DATE S	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date		Section C	Chief Eng	QC Inspector

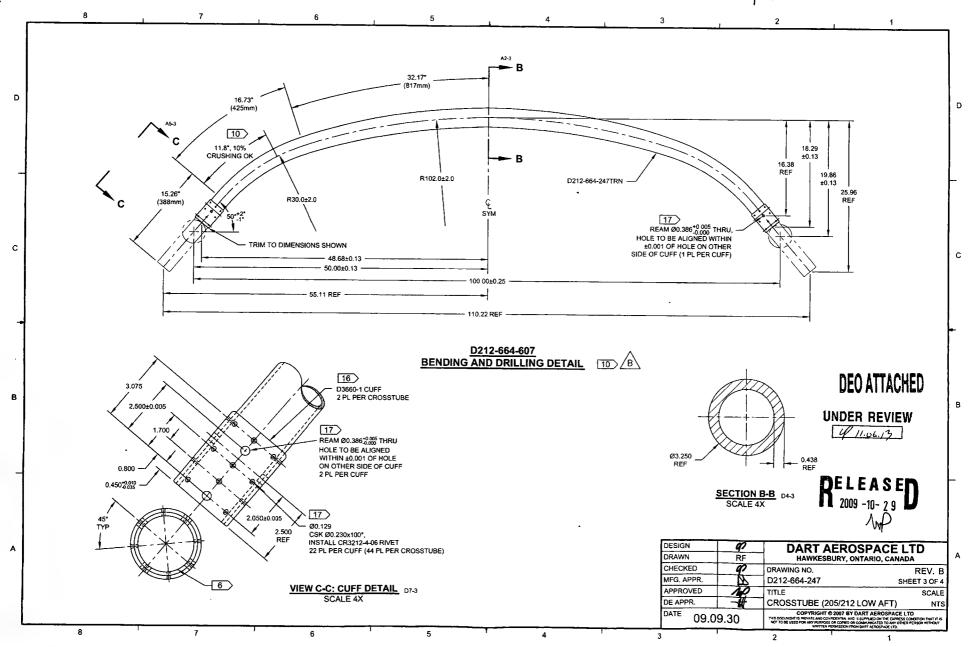
NOTE: Date & initial all entries



### Dart Aerospace Ltd

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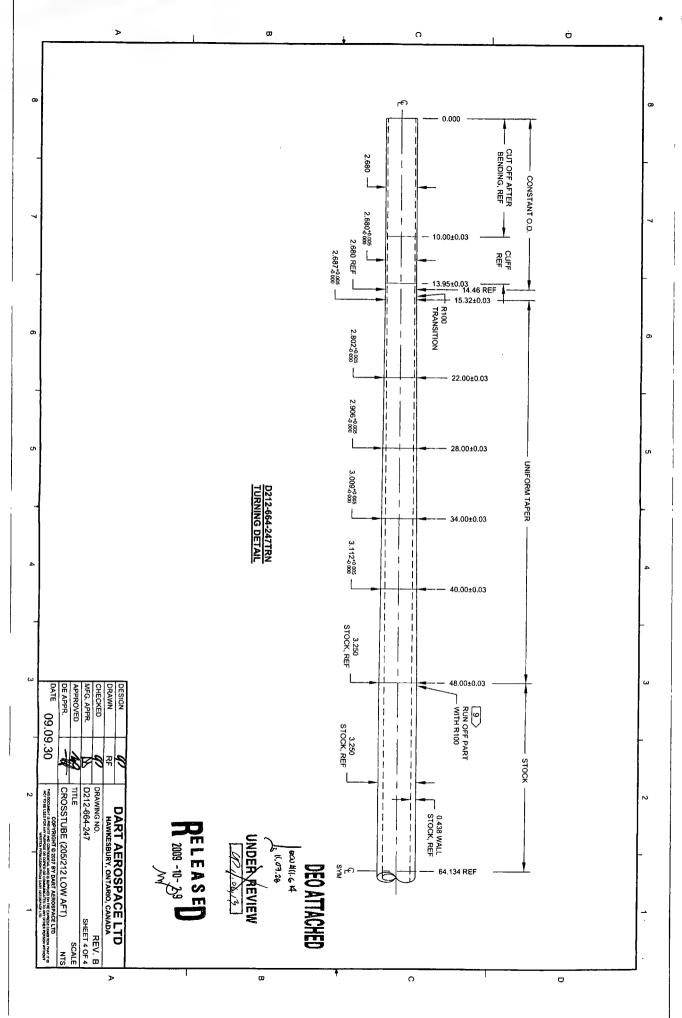
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W/O:		`	W	ORK ORDER CHANGI	ES				_ *
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NOTE: Date & initial all entries



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W/O:			WO	RK ORDER CHANG	ES				3.
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		Description of NC	Corrective Action		on B	Verific	cation	Approval	Approval
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign Date	& Secti	on C	Chief Eng	QC Inspector
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NOTE: Date & initial all entries

DRAWING NO. D212-664-247	TITLE CROSSTUBE ASS'Y (205	REV. B LOW AFT)	DART AEROSPACE L ENGINEERING ORDE		SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN 9		4>5	MFG. APPR.	APPROVED (M)	DE APPR.	NIS
DATE 11.07	.15 DATE //, c	27.70	DATE 11.07.21	DATE 11/07/2)	DATE 11.07.21	

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

#### CHANGE:

IS:

ltem	Qty -247	Qty -247B	Part Number	Description
9	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

#### WAS:

9	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023
				ADHESIVE (TEXTRON/BELL SPEC, 299-947-100,
	L			TYPE II, CLASS 2 ADHESIVE)

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

#### IS:

- 12) TO INSTALL D2940-1 SUPPORT: ABRADE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

#### WAS:

- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.



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W/O:			WORK ORD	ER CHANG	iES				<u>,, , , , , , , , , , , , , , , , , , ,</u>	•
DATE	STEP	PROC	EDURE CHANGE		٠,,	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
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			Media de la companya della companya					-		
Part No	•	PAR #:	Fault Category:		_ NCR	l: Yes I	No DQ	A:	Date: _	
,	R	esolution:	Disposition:	•	_ QA:	N/C Clo	sed:		Date: _	<u> </u>
NCR:		W	ORK ORDER NON-	CONFORM	ANCE	(NCR	)			
DATE	STEP	Description of NC Section A	Corrective Initial Action		tion B	Sign & Date		cation ion C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

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				· · · · · · · · · · · · · · · · · · ·			S. // D. DEV /DAT	- 00
JOB DESCRIPTION	ON	PROCEDURE NO. LT	REV.	/DATE	2008	TECHNIQUE NO. LT	REV. DAT	E 2008
Part No.	SEE	CESW-TS			MATERIAL AL	Luninum	THICKNESS	VALOUS
SCOPE								
3COFE								
Teat Detail 6			140					
TEST DETAILS METHOD	ZÍ FLUC	DRESCENT	VISIBLE		WATER WASH	H SOLVE	NT REMOVABLE	POST EMULSIFIED
FAMILY BRAND	MAGNAI	FLUY			BLACK LIGHT S/N	16459 OUTPU	T > 1000 µ VV/CM	PUT>100 fc @ SURFACE
PENETRANT	267	MINIMUM DWELL TIME	4530 >10	MIN. MIN.	OTHER C	ABINO		
PENETRANT REMOV	SKD 52	MINIMUM DRY TIME MINIMUM DWELL TIME		MIN.	LIGHT METER S/I		CAL DU	EDATE NOU 12
DEVELOPER TYPE		UEOUS AQUEOUS	☐ DR	Υ				200
TEST SURFACE						EL OUGE BLACKER	70	CLEAN BARE METAL
SURFACE CONDITIO	ON 🗀 As GRO	UND AS W	/ELDED :/ 20°F TO 1	000/500	MACHINED	SHOT BLASTED  10°C/50°F TO 52		> 52°C/125°F
SURFACE TEMPERA			/ 20 F 10 1	0 0/30				
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					<del>-</del>		$\times$	
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Scope of Services	Cours In the second course	rvices extends only to those services	provided for in w	vriting. Und	der no circumstances shal	ll such services extend beyond the p	performance of the requested	d services. It is expressly underst ended nor can they be construed
								air and use decisions as a result o
representations or warra	inties. Acuren Group Inc.	Is not assuming any response	un Inc's liability	in respect	of the services referred to	herein exceed the amount paid for	such services.	
Standard of Care	es provided, Acuren Group	Inc. uses the degree, care and skill	ordinarily exerci	sed under s	imilar circumstances by o	thers performing such services in t	ne same or sential totally.	
implied, is made or inten	nded by Acuren Group Inc.						-	

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CLIENT REPRESENTATIVE

TECHNICIAN (SIGNATURE):

NAME (PRINT):

CGSB LEVEL

CGSB REG. NO

CGSB REG. NO

CLIENT REPRESENTATIVE

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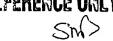
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# REFERENCE ONLY

### DART AEROSPACE LTD.



IIN-D212-664 Page 23 of 25

### STANDARD GEAR CROSSTUBES

Item	-107	-207	-209	Part Number	Description
	х			D212-664-107	CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD FWD
		х		D212-664-207	CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD AFT
			Х	D412-664-209	CROSSTUBE INSTALLATION, 412 STANDARD AFT
6	1			D212-664-147	CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD FWD
7		1		D212-664-247	CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD AFT
8			1	D412-664-249	CROSSTUBE ASSEMBLY, 412 STANDARD AFT
10	2			* D2893-1	SUPPORT
11	4			* D3595-063-450	RUBBER CUSHION
12	4			* MS21920-25	CLAMP (OR MS21042-26)
13	4			AN6-35A	BOLT
	4			AN6-36A	BOLT
14 15	6			MS21042L6	NUT (OR MS21042-6)
16	18			AN960JD616	WASHER
-10					
20		2		* D2940-1	SUPPORT
21		4		* D3595-063-530	RUBBER CUSHION
22		4		* MS21920-28	CLAMP (OR MS21042-30)
23		54		AN6-40A	-BOLT
24		2		AN6-41A	BOLT 3
25		<u>6</u>			NUT (OR MS21042-6)
26		<b>C</b> 18 -		-AN960JD616	-WASHER
30			1	* D2896-1	SUPPORT
32			2	* D3595-063-570	RUBBER CUSHION
33			4	* MS21920-28	CLAMP
34			2	* MS21920-30	CLAMP (OR MS21042-32)
35			4	AN6-40A	BOLT
36			2	AN6-41A	BOLT
37			6	MS21042L6	NUT (OR MS21042-6)
38			18	AN960JD616	WASHER
39			2	* D3189-1	CHAFING SHIELD
45	2			* D3659-1	CUFF
46		2	2	* D3660-1	CUFF
47	44	44		* CR3212-4-06	RIVET (M7885/3-4-06)
48	-9-4	77	44	* CR3212-4-07	RIVET (M7885/3-4-07)
50	1	11		D3428-1	PLACARD

\*REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-147/-247 OR D412-664-249 ASSEMBLIES ABOVE NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AAI SKIDTUBES.

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